

We'll begin momentarily. While you wait...

Which of these ChatGPT generated responses are false?

A

KU

Who played Spiderman in the Avengers Endgame?



Spider-Man, also known as Peter Parker, was portrayed by Tom Holland in "Avengers: Endgame." Tom Holland has been playing the character in the Marvel Cinematic Universe (MCU) since his debut in "Captain America: Civil War" and has continued to portray Spider-Man in subsequent MCU films, including "Avengers: Infinity War" and "Avengers: Endgame."



B

KU

Why are the University of Alberta colours green and gold?



The University of Alberta's colors, green and gold, have a historical and symbolic significance:

1. **Green:** Green is often associated with growth, renewal, and nature. In the context of the University of Alberta, green represents the university's commitment to growth and progress through education and research. It also reflects the natural beauty of the Alberta landscape, which includes lush forests and abundant greenery.
2. **Gold:** Gold is typically associated with excellence, prestige, and achievement. It symbolizes the high standards of academic excellence and the achievements of the university's students, faculty, and alumni. Gold is often used to represent the pursuit of knowledge and the value of education.

The specific choice of these colors for the University of Alberta likely also draws on broader academic traditions, where universities often adopt distinctive colors to represent their identity and values. These colors are used in the university's branding, sports teams, and various other aspects of its identity.

ChatGPT 101:

Introduction to Generative AI

Janice Kung
University of Alberta Library



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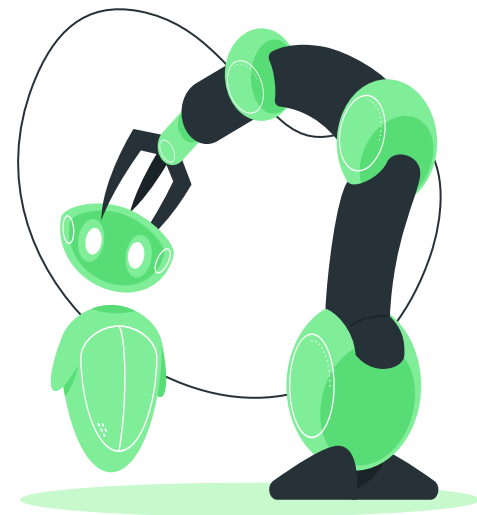


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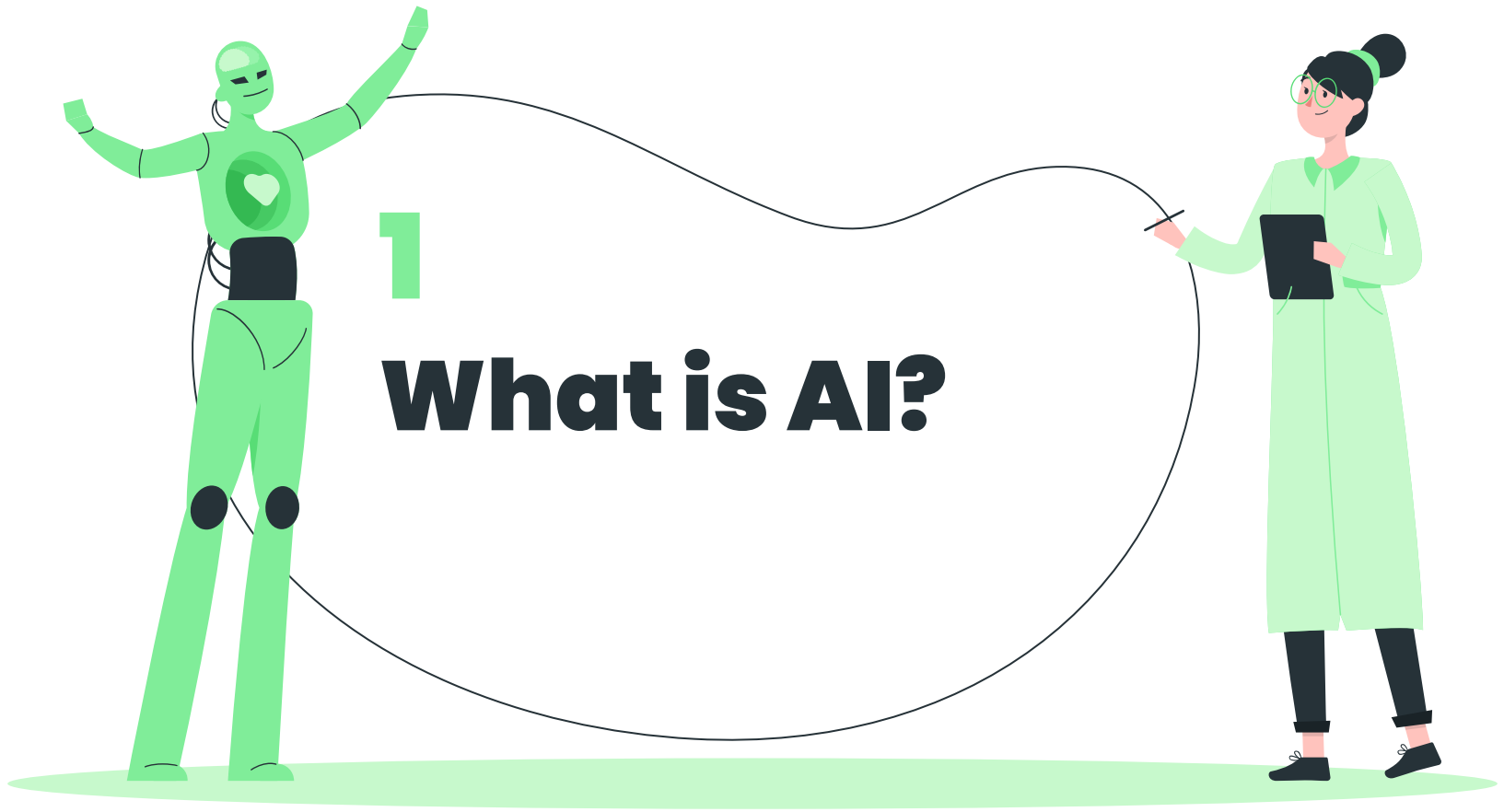
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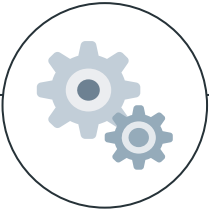
What do you need to know?



1

What is AI?

Types of Artificial Intelligence



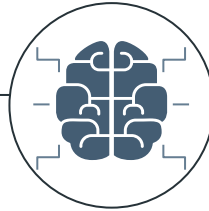
Machine Learning

Stage-1

Artificial Narrow Intelligence

Specialises in one area to solve a specific problem.

E.g. Siri, Alexa, Google Assistant

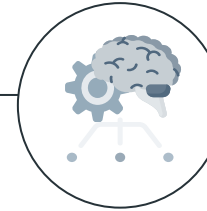


Machine Intelligence

Stage-2

Artificial General Intelligence

Generalized to solve problems as well as any human.



Machine Consciousness

Stage-3

Artificial Super Intelligence

Intellect much smarter than the best humans in all fields.

Some Major Players



Google/Alphabet

Google Bard (not available in Canada yet)



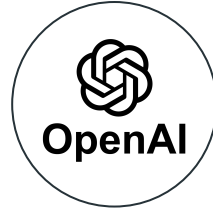
Meta/Facebook

LLaMA



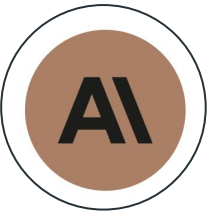
Nvidia

Enterprise-level tools, providing hardware and software for all AI providers



OpenAI

ChatGPT, DALL-E (image generation)



Anthropic

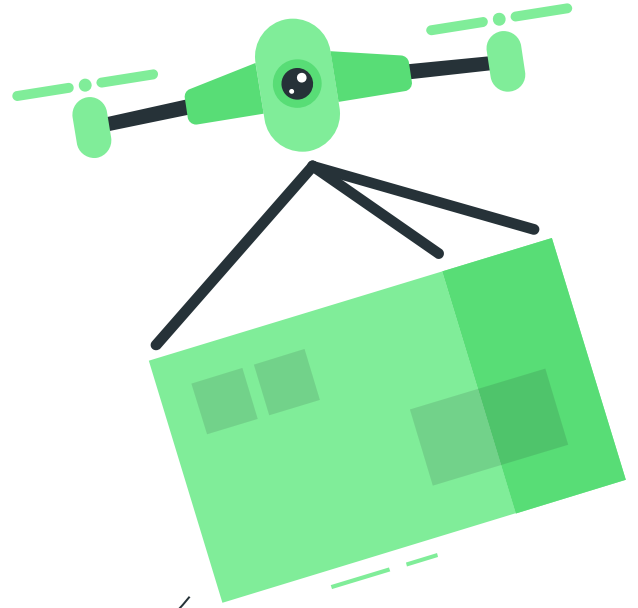
Claude (not available in Canada yet)



Microsoft

Bing Chat (Powered by OpenAI)

Defining the Terminology



Definitions

Natural Language Processing (NLP)

A field of AI where computer science meets linguistics to allow computers to understand and process human language.¹

Large Language Models (LLMs)

These models are built using deep learning techniques, which enable them to understand the nuances of language.²

Generative AI

A type of AI system capable of generating text, images, or other media in response to prompts. E.g. using LLMs to predict and generate the most probable words in a sequence based on large data sets.³



Let's take a step back...

LLMs

Create Tokens

GPT-3 Codex

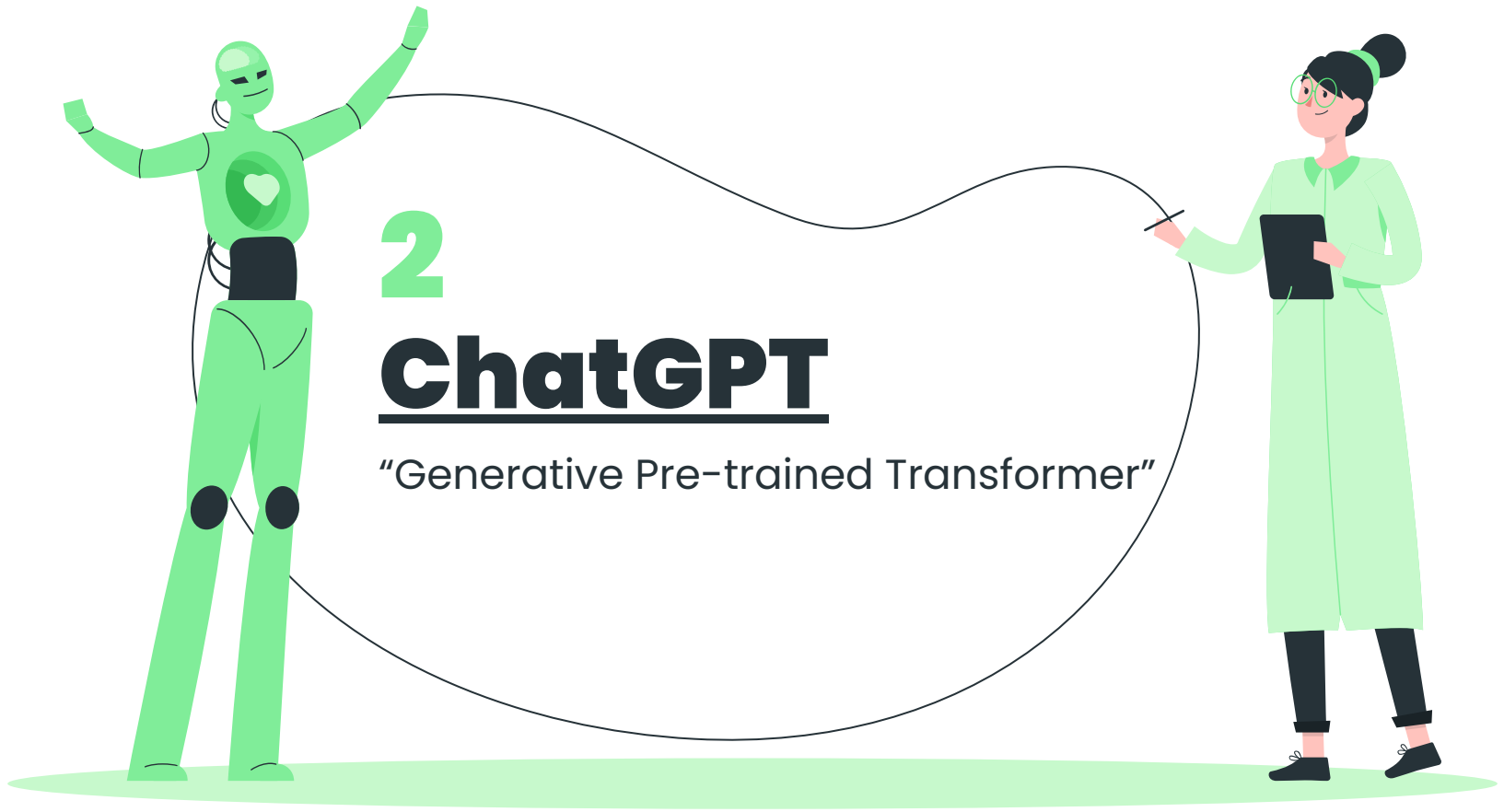
Here is a sentence broken into tokens. Notice how most words are their own token, but that sometime names or complete words like ChatGPT, or mispeeled words, and , punctuation: , "are their" own tokens! As a rule of thumb for expressions in the English language there are approximately 750 words per 1000 tokens.

Clear

Show example

| Tokens | Characters |
|--------|------------|
| 68 | 312 |

Here is a sentence broken into tokens. Notice how most words are their own token, but that sometime names or complete words like ChatGPT, or mispeeled words, and , punctuation: , "are their" own tokens! As a rule of thumb for expressions in the English language there are approximately 750 words per 1000 tokens.



2

ChatGPT

“Generative Pre-trained Transformer”

How Large Language Models (LLMs) are Made?⁴

1. Collect vast amounts of data (**training data**)
2. Transform data into tokens (parts of words) → trained on 500 billion tokens!
3. Unsupervised learning: training the model (weeks to months). It creates a huge mathematical representation of human language.
4. **Fine-tuning**: Expose it to new tasks and give it more guidelines
5. **Reinforcement learning with human feedback (RLHF)**: Use human reviewers to rate responses to improve quality. The model learns from those ratings.
6. **Deploy to the public**: GPT 3.5 → “a research preview.” Learn from more people using it so it can be improved.

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The Training Data

Table 1: Datasets used to train GPT-3⁵

| Dataset | Weight in training mix |
|-------------------------|-------------------------------|
| Common Crawl (filtered) | 60% |
| WebText2 | 22% |
| Books1 | 8% |
| Books2 | 8% |
| Wikipedia | 3% |

OpenAI's Progress:⁴

- 2018: GPT-1
- 2019: GPT-2
- 2020: GPT-3
- **2021: DALL-E* (images)**
- 2022: Instruct GPT
- **Nov 2022: ChatGPT***
- **Mar 2023: ChatGPT Plus***

* For the public

⁵Brown TB, Mann B, Ryder N, et al. Language Models are Few-Shot Learners. 2020. Accessed July 26, 2023. <https://arxiv.org/pdf/2005.14165.pdf>

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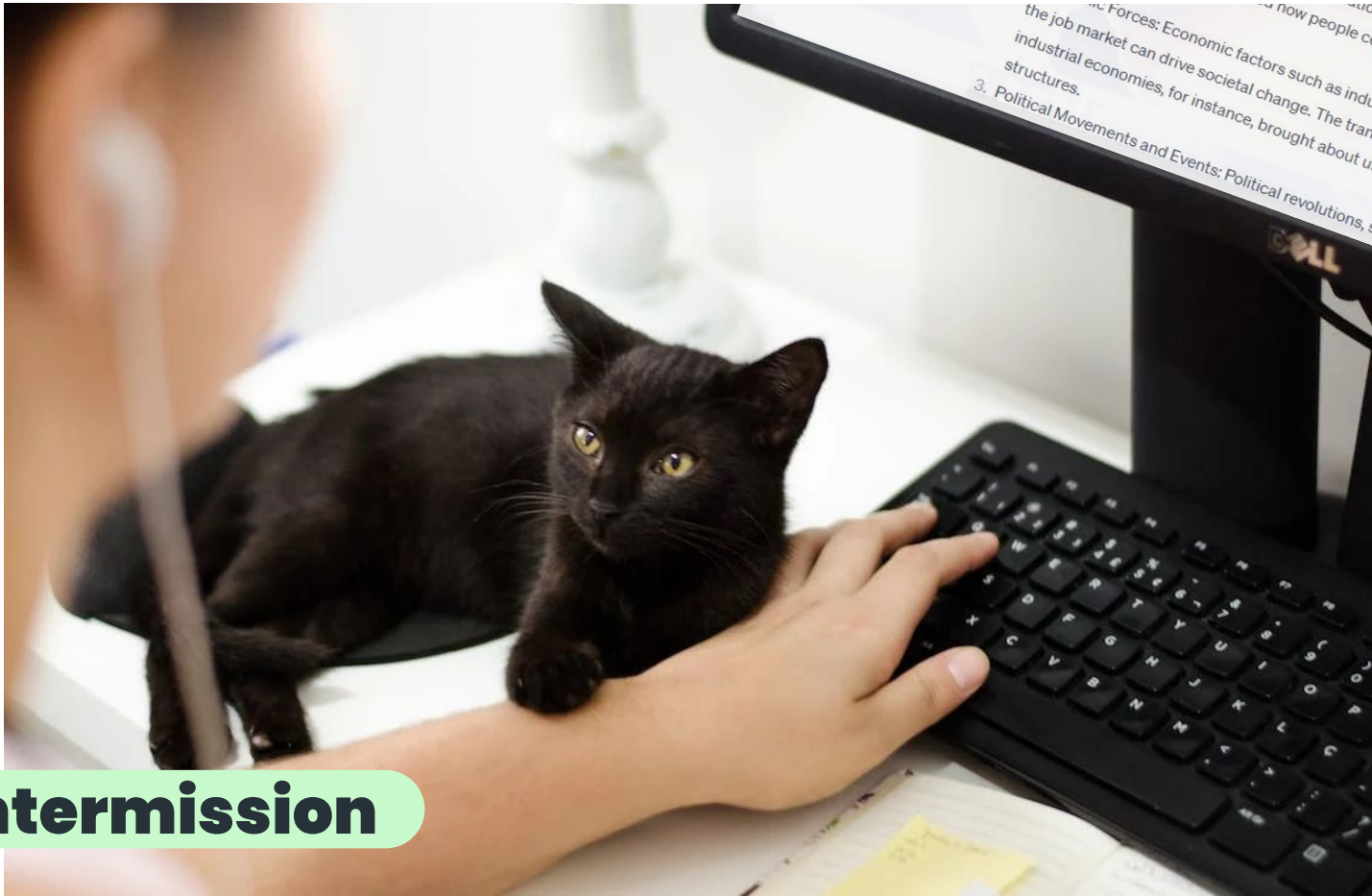
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Intermission

Image source: [Ruca Souza](#)

Basic Text Prediction

➡ The students studied in the _____

| Word (Token) | Probability |
|--------------|-------------|
| Waterpark | 1% |
| Attic | 7% |
| Bedroom | 50% |
| Library | 99% |

Calculator.. but for words!



with it?

5:01 PM ✓✓

You should make a chocolate mousse! 5:01 PM

what's the secret for baking the best chocolate chip cookies?

5:07 PM ✓✓

To bake the best chocolate chip cookies, you should use high quality ingredients. Also, you should not over bake the cookies.

5:07 PM



Type a message



Prompt Generation

Need good prompts to get
good responses!



CLEAR Framework⁶

Concise
Logical
Explicit
Adaptive
Reflective

⁶Lo LS. CLEARer Dialogues with AI: Unpacking Prompt Engineering for Librarians. Library Technology and IT. Sept 19, 2023. <https://www.choice360.org/webinars/clearer-dialogues-with-ai-unpacking-prompt-engineering-for-librarians/>

1. Concise

- Be specific
- Use simple language
- Prioritize critical information

Instead of “What causes society to change?” go with,

Example prompt:

List three of the most significant social factors during the industrial revolution?

Concise
Logical
Explicit
Adaptive
Reflective

Example Prompt:

KU

What causes society to change?



Society changes for a variety of complex and interconnected reasons. These changes can be driven by a combination of social, economic, political, technological, cultural, and environmental factors. Here are some key factors that contribute to societal change:

1. **Technological Advances:** Technological innovations often lead to significant societal changes. **The invention of the printing press,** for example, played a crucial role in the spread of knowledge and the Protestant Reformation. Similarly, the internet and digital technologies have transformed how people communicate, work, and access information in the modern era.
2. **Economic Forces:** Economic factors such as industrialization, globalization, and changes in the job market can drive societal change. The transition from agrarian economies to industrial economies, for instance, brought about urbanization and shifts in social structures.

VS.

KU

List three of the most significant social factors during the industrial revolution?



The Industrial Revolution, which occurred in the late 18th and early 19th centuries, brought about significant social changes. Three of the most significant social factors during this period were:

1. **Urbanization:** **The Industrial Revolution led to a massive migration of people from rural areas to urban centers** in search of employment in factories and industries. This rapid urbanization resulted in the growth of cities and the development of a new urban working class. Urban areas became crowded and often lacked adequate housing, sanitation, and infrastructure, leading to poor living conditions for many.
2. **Labor Conditions:** The working conditions in factories and mines during the Industrial Revolution were often harsh and dangerous. Long working hours, low wages, and the absence of workers' rights and safety regulations contributed to the exploitation of laborers. Child labor was widespread, with

2. Logical

- Structure info in order (logical flow) → Conversational!
- Establish context and relationships
- Avoid too many instructions in a single prompt⁷

Concise
Logical
Explicit
Adaptive
Reflective

[write them out one at a time]

Example prompts:

- Tell me about the history of the Eiffel Tower.
- Were there any major controversies surrounding the project?
- What major construction materials were used?
- Tell me about its design and designers
- Explain its significance
- Let's talk about the budget

3. Explicit

Concise
Logical
Explicit
Adaptive
Reflective

- **Define instructions**
- Set reading levels, output formats
- Assign a role for ChatGPT to play

Example prompt:

Could you please explain the following passage?

“The value of the modulus of rigidity shows the resistance of a given material to shear deformation. Engineers consider the value of shear modulus when selecting materials for shafts or rods that are subjected to twisting torques.”

3. Explicit

- Define instructions
- **Set reading levels, output formats**
- Assign a role for ChatGPT to play

Concise
Logical
Explicit
Adaptive
Reflective

Instead of “How to apply for the Marie Curie fellowship,” go with something like,⁸

Example Prompt:

Please tell me how to apply for a Marie Curie fellowship? Please limit your answer to five points and tell it to me like I’m a 10-year-old.

Other Output Formats:⁹

- Table
- Bulleted list
- Numbered list
- Summary
- Code
- Story/poem
- Dialogue
- Q&A
- Emojis ... and more!

3. Explicit

- Define instructions
- Set reading levels, output formats
- **Assign a role for ChatGPT to play**

Example Prompt 1:

You are an undergraduate science student.
Describe the Krebs cycle in simple terms.

Example Prompt 2:

Imagine you're a public relations representative dealing with a social media crisis.¹⁰

Draft a press release that acknowledges the issue, explains what actions your company is taking, and reassures the public.

Concise
Logical
Explicit
Adaptive
Reflective

Example Prompt:



You are an undergraduate science student. Describe the Krebs cycle in simple terms.



Sure, I'd be happy to describe the Krebs cycle in simple terms!



The Krebs cycle, also known as the citric acid cycle or the TCA cycle (Tricarboxylic Acid Cycle), is a crucial part of how our cells produce energy. Imagine it as a bit like a power plant for your cells.

Here's how it works:

1. **Fuel In:** The cycle starts when a molecule called acetyl-CoA, which comes from the breakdown of food molecules like carbohydrates, fats, and proteins, enters the cycle.
2. **Molecule Shuffle:** Acetyl-CoA combines with a molecule called oxaloacetate to kickstart the cycle. This combination forms a molecule called citric acid.
3. **Chemical Transformations:** As citric acid goes through a series of chemical reactions, it releases energy and transfers electrons to carrier molecules, like NADH and FADH₂. These molecules are like little energy shuttles.
4. **Carbon Dioxide Out:** During these reactions, carbon dioxide is produced as a waste

4. Adaptive

- Be flexible (rephrase and restructure)
- Try different approaches (be more creative with prompts)

Example Prompt:

What are the ethical concerns with using ChatGPT?

Concise
Logical
Explicit
Adaptive
Reflective

4. Adaptive

- Be flexible (rephrase and restructure)
- Try different approaches (be more creative with prompts)

Example Prompt:

What are the ethical concerns with using ChatGPT?

Follow-up Prompt:

Can you provide 3 more examples?

Concise
Logical
Explicit
Adaptive
Reflective

5. Reflective

Concise
Logical
Explicit
Adaptive
Reflective

ChatGPT will never ever EVER be wrong!*

*** Well, actually... that's not true!**

- Carefully evaluate AI responses
- Identify areas for improvement (it takes time)
- Use insights to further refine strategies for engagement



Assume all responses are incorrect until proven otherwise!

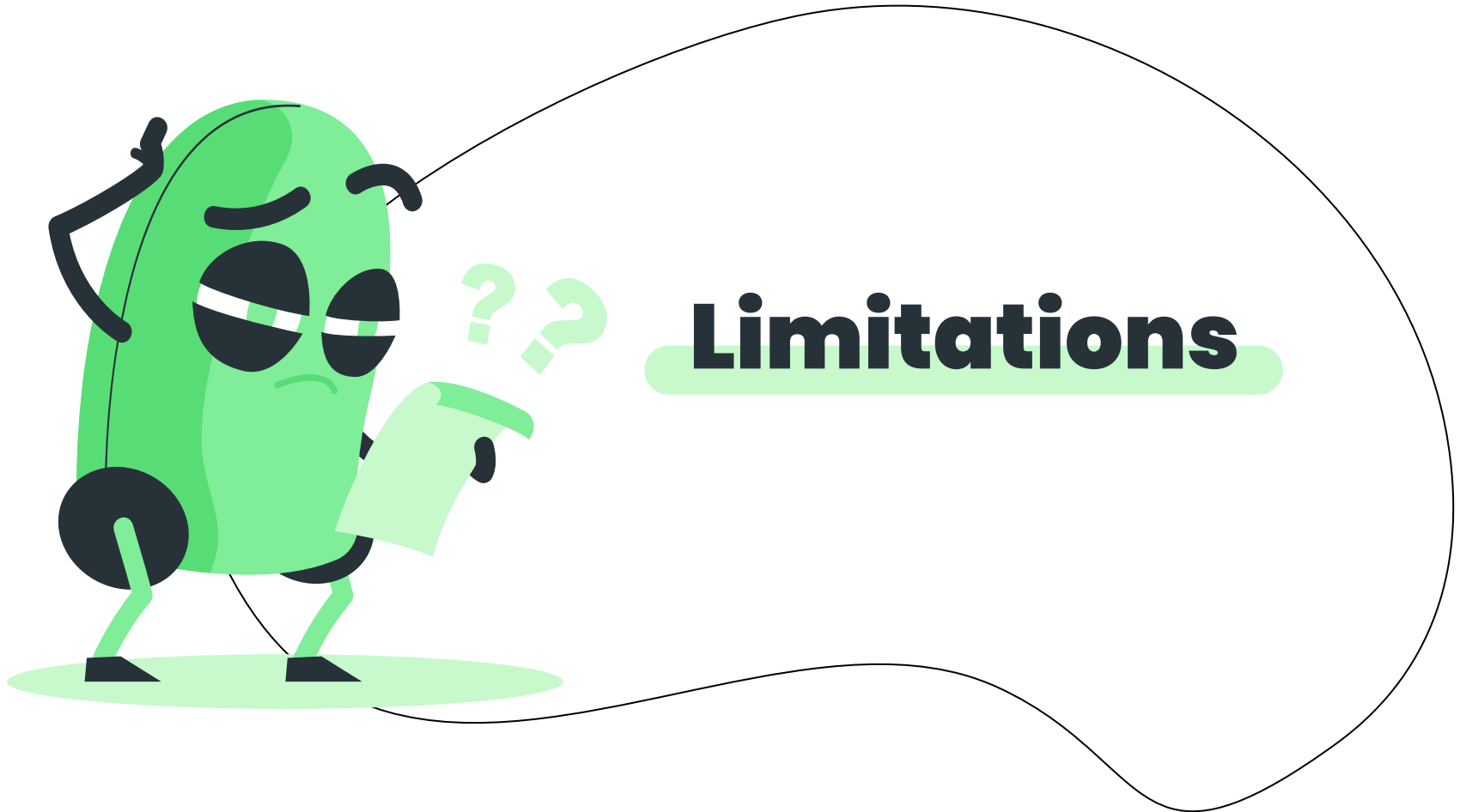


3

Strengths & Limitations

Strengths

| Writing | Learning/Studying |
|--|---|
| <ul style="list-style-type: none">● Generate ideas● Brainstorm research topics● Change citation styles● Editing and proofreading● Suggestions for databases to find literature on your topic <p>“Correct the grammar: [paragraph]”</p> <p>“Identify the gaps in the literature on [topic]”</p> | <ul style="list-style-type: none">● Can explain complex concepts● Summarize information● Practice second languages <p>“Can you explain x in simple terms?”</p> <p>“How about using an analogy to describe it?”</p> <p>“Please summarize [insert book name] by [author] and provide the top 5 important themes.”</p> |



Limitations

What are the Problems?

Limited Knowledge

Data until September 2021, not replicable

Bias

Misinformation

Ethical Concerns



What are the Problems?

Limited Knowledge

Data until September 2021, not replicable



Bias

Misinformation



Ethical Concerns

Misinformation

- Sometimes ChatGPT makes stuff up, called **hallucinations**.
- Remember: based on the **probability** of what the next word should be
- Based on AI model's inherent biases and training dataset limitations
- "These hallucinations are particularly problematic in domains that require multi-step reasoning since a single logical error is enough to derail a much larger solution."¹¹

Examples of Hallucinations

User input:¹²

"When did Leonardo da Vinci paint the Mona Lisa?"

AI-generated response:

"Leonardo da Vinci painted the Mona Lisa in 1815."

(Incorrect: The Mona Lisa was painted between 1503 and 1506, or perhaps continuing until 1517.)





Provide one paragraph summarizing gender-based violence and climate change with citations in APA format. Please include the reference list at the end.



Gender-based violence and climate change intersect in complex ways, exacerbating vulnerabilities and inequalities among affected populations. Climate change disproportionately impacts women and girls due to their socio-economic status and cultural roles, making them more susceptible to violence and exploitation (Abramsky et al., 2020; United Nations, 2018). Environmental disasters and resource scarcity can intensify conflicts and force displaced communities to seek alternative means of survival, exposing women to heightened risks of sexual and domestic violence (UN Women, 2019; Díaz et al., 2021). Additionally, the unequal power dynamics between genders perpetuate violence and hinder women's participation in climate change adaptation and mitigation efforts (Hossain & Scott, 2020; Naved et al., 2022). Addressing the intersectionality of gender-based violence and climate change is crucial for building resilient and equitable societies (Núñez et al., 2021).



References:

Abramsky, T., Devries, K., Kiss, L., Nakuti, J., Kyegombe, N., Starmann, E., ... & Watts, C. (2020). Findings from the SASA! Study: A cluster randomized controlled trial to assess the impact of a community mobilization intervention to prevent violence against women and reduce HIV risk in Kampala, Uganda. *BMC Medicine*, 18(1), 1-15.

Díaz, S. S., Oviedo, G., & Porras, M. A. (2021). Violence against women and climate cha

Regenerate

Send a message



Abramsky, T., Devries, K., Kiss, L., Nakuti, J., Kyegombe, N., Starmann, E., ... & Watts, C. (2020). Findings from the SASA! Study: A cluster randomized controlled trial to assess the impact of a community mobilization intervention to prevent violence against women and reduce HIV risk in Kampala, Uganda. *BMC Medicine*, 18(1), 1-15.

Díaz, S. S., Oviedo, G., & Porras, M. A. (2021). Violence against women and climate change in Latin America. *Geoforum*, 119, 184-190.

Hossain, N., & Scott, J. (2020). Women's economic empowerment and violence against women: evidence from Bangladesh. *Feminist Economics*, 26(3), 1-26.

Naved, R. T., R

Fake References!

violence prevention programme on women's economic empowerment: findings from a cluster-randomised trial in rural Bangladesh. *BMJ Global Health*, 7(2), e005067.

Núñez, L. A., Saavedra, J. E., Borbor-Cordova, M. J., & Nuñez, L. A. (2021). A socioecological view of gender-based violence and climate change: Recommendations for intervention. *Frontiers in Psychology*, 12, 653543.

UN Women. (2019). Brief on gender, violence against women and climate change. Retrieved from

<https://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2019/brief-gender-violence-and-climate-change-en.pdf>

United Nations. (2018). UN policy brief: The impact of climate change on women. Retrieved from

[https://www.unwomen.org/-/media/headquarters/attachments/sections/library/pub](https://www.unwomen.org/-/media/headquarters/attachments/sections/library/publications/2018/unwomen-policy-brief-the-impact-of-climate-change-on-women-en.pdf)

🔄 Regenerate

Send a message



Identify Errors & Fake Citations

1

Does it exist?

Search each reference in the library's catalogue or Google.

2

Ask for more details

"Could you provide an ISBN or ISSN for this publication?"

3

Was it properly summarized?

Consult the material to verify if it was summarized correctly.

Activity

Which citation is fake?

- A) Djoudi, H., Locatelli, B., Vaast, C., Asher, K., & Brockhaus, M. (2016). Beyond dichotomies: Gender and intersecting inequalities in the context of climate change in Cameroon. *Climate and Development*, 8(3), 201-214.
- B) Desai, B. H., & Mandal, M. (2022). The Cost of Climate Change Heightened Sexual and Gender-based Violence: A Challenge for International Law. *Environmental Policy & Law*, 52(5/6), 413-427. <https://doi.org/10.3233/EPL-219049>

Bias

- Bias exists in the training data itself (sexism, racism, homophobia, ableism, etc.)
- Western, English focused (developed in the US)
- Not enough information or nuance for certain types of content in the dataset
- **Only humans** have the skillset to think critically, conduct nuanced research, and fact-check!

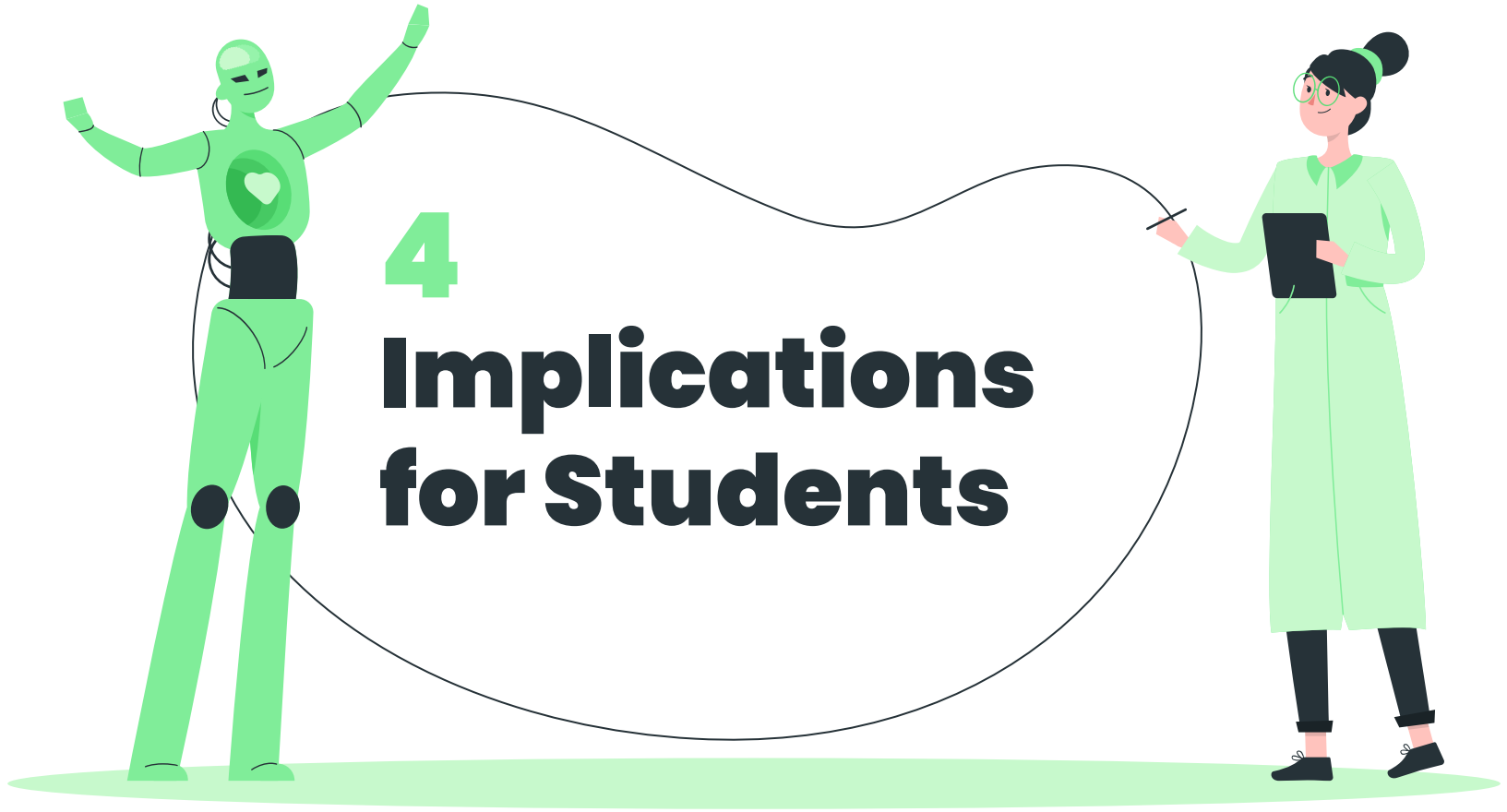
Ethical Concerns

- Copyright
- Low wages to humans training ChatGPT¹³
- Dependency on AI
- What else?

BUSINESS • TECHNOLOGY

Exclusive: OpenAI Used Kenyan Workers on Less Than \$2 Per Hour to Make ChatGPT Less Toxic





4

Implications for Students

What do you need to know?

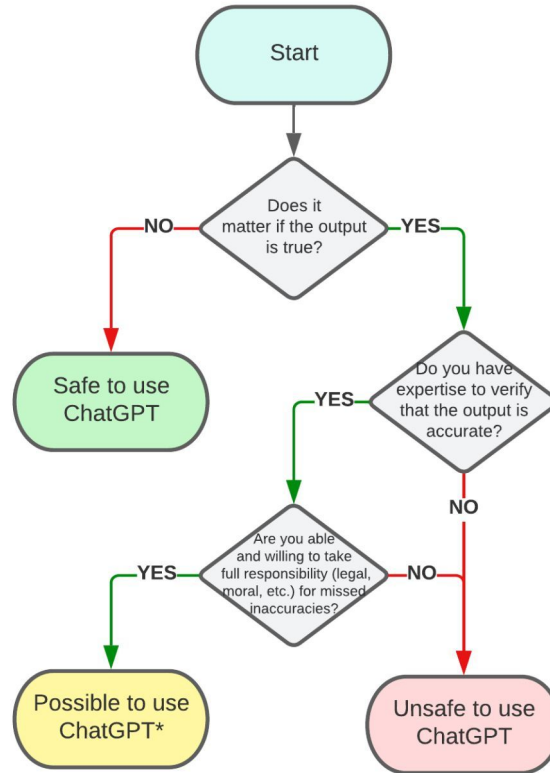
- Check with your instructor and course syllabus.
- “A key attribute of graduate education is the need to critique and criticize content and methods: this also applies to Generative AI.”¹⁴
- **Code of Student Behaviour states:** “No Student shall represent another’s substantial editorial or compositional assistance on an assignment as the Student’s own work.”
Submitting work created by generative AI and not indicating such would constitute cheating as defined above.¹⁵
- Citing ChatGPT and other generative AI tools.
<https://guides.library.ualberta.ca/citing/ai>
- The U of A Library remains an authoritative resource.

Additional Resources

- [Centre for Teaching and Learning Instructional Practice](#) - more prompt examples
- [Consider This: ChatGPT, teaching and learning in an AI world](#)
- [How to use ChatGPT as a learning tool](#)
- <https://learnprompting.org/> (note: sponsored by major AI companies)

Is it safe to use ChatGPT for your task?

Aleksandr Tiulkanov | January 19, 2023



* but be sure to verify each output word and sentence for accuracy and common sense

Ashish Vaswani*
Google Brain
avaswani@google.com

Noam Shazeer*
Google Brain
noam@google.com

Niki Parmar*
Google Research
nikip@google.com

Jakob Uszkoreit*
Google Research
usz@google.com

Llion Jones*
Google Research
llion@google.com

Aidan N. Gomez* †
University of Toronto
aidan@cs.toronto.edu

Lukasz Kaiser*
Google Brain
lukaszkaizer@google.com

Illia Polosukhin* ‡
illia.polosukhin@gmail.com

“Attention is all you need”

Abstract

The dominant sequence transduction models are based on complex recurrent or convolutional neural networks that include an encoder and a decoder. The best performing models also connect the encoder and decoder through an attention mechanism. We propose a new simple network architecture, the Transformer, based solely on attention mechanisms, dispensing with recurrence and convolutions entirely. Experiments on two machine translation tasks show these models to be superior in quality while being more parallelizable and requiring significantly less time to train. Our model achieves 28.4 BLEU on the WMT 2014 English-to-German translation task, improving over the existing best results, including ensembles, by over 2 BLEU. On the WMT 2014 English-to-French translation task, our model establishes a new single-model state-of-the-art BLEU score of 41.0 after training for 3.5 days on eight GPUs, a small fraction of the training costs of the best models from the literature.

References

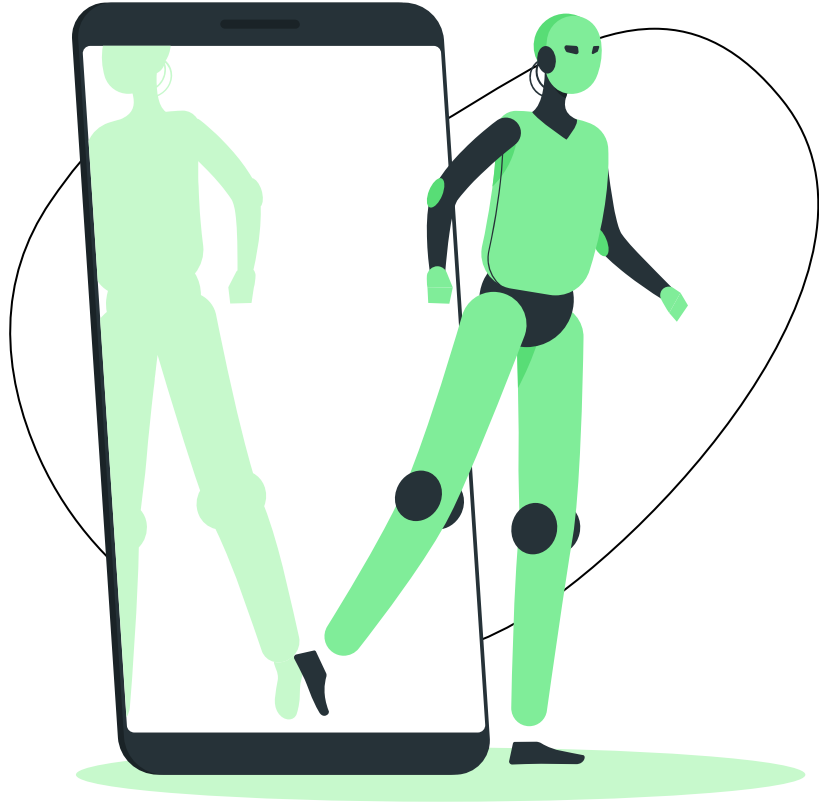
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Thanks!

Questions?
janice.kung@ualberta.ca

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